Worcester Polytechnic Institute
Digital WPI

Interactive Qualifying Projects (All Years) | Interactive Qualifying Projects

August 2010

Stock Market Simulation

Dax Linden Druminski
Worcester Polytechnic Institute

Project Number: DTZ 1005

An Interactive Qualifying Project Report: submitted to the Faculty of

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

By

Dax Druminski_________________________

Approved by Professor Dalin Tang, Project Advisor

____

Abstract

Through the use of various texts, electronic resources, and media outlets, a ten-week stock market simulation was conducted to explore the effects of different trading strategies on stock market investment. Based on extensive research, two virtual portfolios were created to explore aspects of technical and fundamental analysis. The experience gained through this project provided good training for the participants to become more competent investors.

Table of Contents

Table of Figures

1 Goals and Methods

The primary goal of the stock simulation project is to develop an understanding of investing styles and techniques. After researching several investment strategies, I decided to conduct a simulation to explore both fundamental and technical analysis. I realized that it would be difficult to compare investing styles directly due to the amount of uncontrolled variables involved. Getting acquainted with the investing styles and performing the analysis is more valuable than the results I will obtain.

My first objective is to become familiar with the operations of the stock exchange and the different security analysis techniques. "Operations" refers to the economic, social, and political factors that affect stock price. Like most successful investors, I intend to follow general business news.

My second objective is to justify my simulated investments with research and analysis. I will have two simulation portfolios: one based on fundamental analysis and value investing, the other based on technical analysis. My fundamental analysis will involve looking at company websites, presentations, media appearances, and financial reports. I will use the Morningstar premium stock screener to narrow down the list of companies I want to investigate; I'll screen stocks based on valuations like the Price to Earnings Ratio and Cash Flow. Even professionals find it difficult to analyze companies correctly, so I don't expect all of my stock picks to be perfect. I do intend to develop buy cases for all of the stocks in the "fundamental analysis" portfolio. A buy case is a list of pros and cons relating to the purchase of the stock; the buy case changes as new information surfaces about the company in question, so it'll require continual attention.

My third goal involves conducting technical analysis for the second portfolio. While most technicians are good at "connecting straight lines", I want to make sure that the trends I recognize are relatively valid. Stockcharts.com offers basic information about chart types and trends, so that will be my starting point. As time progresses, I will read more about the subject and perhaps my techniques (and portfolio holdings) will change.

My first portfolio will contain mostly value stocks; I intend to add a few "quality" stocks to the mix to diversify my portfolio. When performing the stock screen, I will look for a price to book ratio below one, a P/E ratio below the sector average, a PEG ratio below one, a growth in cash flow (recent fiscal year compared to the year before that), and a high dividend yield. Portfolio #1 will revolve around fundamental analysis.

My second portfolio will contain a diversified mix of stocks (same number of stocks that portfolio #1 contains). I will select these stocks based on technical analysis, using charts to find good candidates for a five week simulation period. Without any extensive reference to the media, I will make my decisions based on price movements.

1.1 History of the Stock Market

The origins of the stock market can be traced back to ancient Rome. The Roman republic, during the second century B.C., was a center of commerce where people traded all sorts of commodities. Rome had three key financial catalysts: capital, a credit system, and a group of individuals willing to take financial risks. It was only a matter of time before an organized market of equities began to take shape. The market revolved around the public Forum, which one historian referred to as "…an immense stock exchange". Investors, known as *publicani*, bought and sold *particulae* in the Forum, which are similar to shares. Roman executives also hired the *publicani* to handle public accounts and shareholder meetings. The Roman republic represents one of the first advanced financial systems, a precursor to the markets that would later develop in places like Amsterdam, London, and New York (Smith, 11).

During the sixteenth century, the European economy began to transform as governments sought new ways to finance their war efforts. Rulers experimented with new financial techniques like annuities and bills of exchange (first form of paper money). The first permanent stock exchange, known as the bourse (French for purse) appeared in Antwerp, Belgium. Businessmen, bankers, and merchants gathered in the bourse on a regular basis, making it a "continuous fair". After Antwerp was invaded by Spanish troops in 1585, Amsterdam became the prominent financial leader in the West. Amsterdam became even more significant with the establishment of: 1) the Wisselbank, which employed a form of currency known as the *banco* and 2) the Dutch East India Company, the first joint-stock company with a permanent charter. A joint-stock company was divided into shares; investors were not partners in the company, which allowed the company to attract a much larger amount of capital from varying locations. In 1688, these financial innovations passed on to England with William of Orange's rise to power (Smith, 16). The British financial revolution that followed would lay the foundation for the modern market economy, influencing the creation of the New York Stock Exchange in 1792.

The New York Stock Exchange, the first stock exchange in the U.S., was founded on May 17, 1792 when twenty four stock brokers signed the Buttonwood Agreement on Wall Street (www.NYSE.com). The NYSE was created to accommodate the growth of corporations; New York City, as the financial center of the U.S., was an appropriate location for it. The NYSE was in many ways a reflection of the U.S. economy; both grew at a rapid pace. In 2007, Euronext, the panEuropean stock exchange, merged with the NYSE to form the first international stock exchange.

1.2 Reasons to Invest

A variety of factors can motivate an individual to invest. Firstly, investment is a great way to build wealth and achieve personal financial goals. For example, an individual can have a solid career and save a substantial amount of their salary, but they may not be able to afford a vacation in Hong Kong. This individual then develops a diversified portfolio and is able to pay for the trip with his/her returns. A novice investor would be foolish in attempting to beat professional money managers, but modest returns are within reach. Furthermore, investing teaches an individual about business and finance. An investor should have some background knowledge when they approach financial advisors and ask questions or, more importantly, when taking advice. Advice can come from illegitimate sources or be skewed by conflict of interest.

Some investors seek advice from brokers that make a living off of commissions. Brokers claim to have teams of researchers that watch and analyze stocks, which are used to decide whether to buy, sell, or hold a security. However, the broker may have ulterior motives if they are working for a company. Companies hire brokers to help them sell stocks and bonds, obligating brokers to give positive feedback about the company. While it may seem that the broker and investor both want the company to succeed, the investor is left vulnerable if the company tanks, for whatever reason. An investor requires knowledge and experience to root out biased information, or information from unreliable sources.

Investing, for many, is a fulfilling hobby that offers a lot of freedom. Investors generally enjoy picking stocks and researching companies that interest them. When picking stocks, individuals may consider small cap and high growth securities, securities that funds might pass on due to the inherent risk. Small cap stocks are more volatile, but they have higher historical returns, namely 15.4% from 1927 to 2005 (without adjusting for inflation) (Tyson, 82). In order to reap the highest returns, one needs to become an accredited investor. This title gives an individual access to unregistered securities, high profile hedge funds, and other expensive investment vehicles that are beyond the reach of amateur investors. An understanding of investing and personal finance may lead to the realization of more financial opportunities.

2 Investment Vehicles

Investment is defined as laying out money or capital in an enterprise with the expectation of profit. An investment vehicle, in turn, is any method by which to invest. Some vehicles include stocks, mutual funds, bonds, and certificates of deposits. Each investment vehicle has advantages and disadvantages depending on the needs of the investor and the current state of the market. Furthermore, vehicles have certain traits to consider, including risk, annual return, volatility, minimum deposits, etc.

2.1 Stocks

Some individuals assert that stocks are among the more risky, volatile investment vehicles, and this may very well be true in the short term. For example, a momentum investor might observe a stock that has climbed steadily for several months; the investor buys the stock at its peak, right before its price plummets. In this scenario, a large swing in the price of a stock is possible in a short amount of time. However, when considering long term investment, the stock market has almost always had positive annual returns (after holding stocks for over 1 year). According to this theory, trading stocks frequently is a mistake.

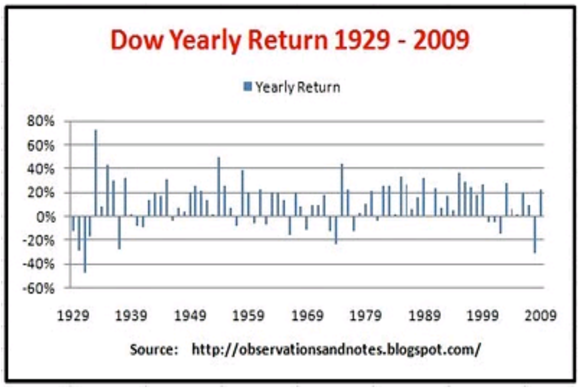

Figure 2.1: Historical Stock Market Returns

2.2 Mutual Funds

Mutual Funds are professionally managed funds that employ teams of researchers to select the most ideal investments. A novice investor can count on a mutual fund to be relatively simple and safe. Most individuals would not have the time or expertise to outperform full-time professional fund managers, so a mutual fund becomes appealing. However, less risk translates into less reward. A safe mutual fund may have a higher return than a savings account, but it does not have the volatility of a small cap stock. Furthermore, an investor has to consider the fees associated with a particular fund.

2.3 Bonds

A bond is a type of lending investment in which a corporation or government borrows money from an investor at a specific interest rate. A corporation typically makes interest payments at regular intervals until the bond reaches maturity. Bonds are useful because of guaranteed returns that are independent of the state of the economy; perhaps this would be advantageous in the turbulent market. However, bonds have a number of disadvantages. When a corporation issues a bond, the investor assumes that the company will grow, allowing the company to pay the investor back. A corporation may lose business, causing the bond to default; a default means a company was unable to pay the investor back, for whatever reason. Also, bonds usually have a minimum deposit upwards of ten thousand dollars. An investor who can't afford investing directly in bonds can consider a bond fund, which is based on bond performance.

2.4 Certificates of Deposits

Much like savings accounts, Certificates of Deposits (CD's) are lending investments that offer a miniscule return for a very low risk. With CD's, an investor lends money that can't be touched for a certain period of time (otherwise a penalty fee is incurred). CD's provide a safe place to store money while letting it slowly grow. However, the small return (less than 5%) is further diminished by the effects of inflation. For example, an investor might place one hundred dollars in a CD for one year with a 3% return. The three dollar return will be overshadowed by the effect of inflation; what costs one hundred dollars today will probably cost more than one hundred dollars one year from now, reducing the purchasing power of the return (Tyson, 14).

2.5 Exchange Traded Funds

Exchange-traded funds (ETFs) were introduced in the U.S. in 1993, making them relatively new. ETFs are similar to mutual funds, except that they are traded on a stock exchange through a broker. Shares within an ETF can be traded, but only in large blocks called "creation units". Also, the value of the ETF is not necessarily the net asset value (NAV), the value of the portfolio's assets minus liabilities. Investor demand can drive the value of the ETF slightly higher or lower than the NAV. ETFs are appealing due to lower taxes and operating costs; however, this is somewhat offset by broker fees.

2.6 Hedge Funds

A hedge fund attempts to reduce exposure to unwanted financial risk by playing off of different market positions (among other techniques). Like mutual funds, hedge funds are professionally managed investment vehicles. Hedge funds are geared toward wealthy investors, where portfolio assets can run into the billions of dollars. Furthermore, these funds are associated with high management fees, often 1 to 1.5%; a 20% cut of the annual returns is not unheard of. Facing less stringent SEC regulations, hedge funds use strategies like leveraging to try and maximize returns, which, at the same time, increases the risk of loss. Investors who cannot afford to invest in hedge funds may invest in a fund of hedge funds (http://www.sec.gov/answers/hedge.htm).

3 Investment Strategies

3.1 Day Trading

Day trading is the practice of buying and selling an instrument (stocks, futures, etc.) within one day. A day trader often makes several trades a day, looking for securities that are about to jump in price. However, short term or frequent trading is not recommended for a number of reasons. Firstly, fees and taxes increase as the number of trades increase, resulting in depressed returns. Every time an investor buys and sells a stock, a broker or a website collects commission. All sales and purchases must then be reported on an annual income tax report, which can quickly become a hassle. Returns from the stock market are also taxed; taxes on stock market profits can be high, especially if the profits are considered short term profits (day trading certainly qualifies). The return after taxes is more important than the return before taxes; an investor needs to consider how much profit he will be allowed to keep.

Another problem with day trading is the potential to miss sharp rises in a stock's price. A stock can jump in price in a relatively short period of time, a small window that may be missed when a stock is bought and sold within a week or a day (Tyson, 103).

Countless books and resources claim to solve the mystery of day trading, offering advice on how to play the market. At the same time, some experts assert that technical analysis can be used to profit off of frequent trading. However, according to the efficient market theory, prices reflect all of the information available about a particular security; information that one expert has is available to everyone else, therefore no one has a definite advantage in the market. Most prudent financial advisors claim that it is futile to try and time the market. By the time an investor hears about a popular stock, a large number of other investors have been alerted to it as well. Investors, who behave predictably by trying to take advantage of the market, make it difficult to beat the market regularly; if the market had truly predictable trends, at least one investor would have mastered it by now (http://www.investopedia.com/articles/02/101502.asp).

Day traders often spend inordinate amounts of time researching stocks and company profiles in an attempt to make the best picks. While some day traders are highly successful, many fail in their efforts. Successful trading requires confidence, luck, ample research, and, in some cases, a natural ability to pick stocks. Day trading can be compared to gambling, and some investors find themselves obsessed with the pursuit. While the potential for quick gain in the stock market may be appealing, a diversified, long-term portfolio is definitely a more conservative option.

3.2 Speculative Bubbles

Financial markets are influenced by hundreds of factors, including political events, shifts in the economy, social beliefs, etc. Experts attempt to use complicated mathematical systems to analyze and predict the behavior of companies and investors. Clearly, the movements of financial markets are hard to predict accurately, especially for a novice investor. As a result, timing the market and thus short term trading are discouraged; a security should be traded due to a change in fundamentals or if information (charts or otherwise) points to a trend shift, not in response to a random price change. The difficulty and danger of trying to time the markets is illustrated by the speculative bubbles that have occurred over the years.

A speculative bubble develops when investors are drawn to an investment in a hyped state, causing the security's price to become inflated. By the time everyone has heard about the investment, it has probably reached near-maximum growth. This phenomenon can be seen with the explosive growth of dot.com companies in the late 1990's. Internet-based companies like AOL, Yahoo!, and Amazon.com attained extremely high P/E ratios as they started out. In 1999, Amazon.com had a total market value of $35 billion, 12 times the value of competitor Barnes and Nobles. By 2001, Amazon's market value had dropped to 2 billion, a 95% decrease (Tyson, 92). At the time, many dot.com companies were losing money or just beginning to make profits and analysts tried to value internet stocks using revenue instead of earnings. Unfortunately, revenue doesn't predict future growth and profits very well. Stocks with high valuations dropped in price when earnings didn't live up to investors' expectations.

Another example of speculative fever is the tulip mania in Holland during the late 1500's. A botanist brought tulips from Turkey and introduced it to Holland, resulting in an investing craze. The price of a single tulip bulb skyrocketed, reaching the equivalent of $10,000 dollars in today's dollars. Laborers would cut back on work to invest in the tulip trade, and even traded acres of land for single bulbs. Eventually, the price of tulips fell to reasonable levels as demand waned.

Unfortunately, people tend to buy stocks after a dramatic price increase. Beginner investors try to time the market based on the past performance of a stock and advice from other novice investors. Without adequate research or advice, following the crowd can translate into huge losses. In fact, some investors are considered contrarians, individuals who act against the majority opinion.

3.3 Fundamental versus Technical Analysis

Investors use technical and/or fundamental analysis to interpret the market. A fundamental analysis looks at company profiles and long term data – balance sheets, revenues, PE rations, earnings, cash flow, etc. The company profile can help measure the company's intrinsic value, which is a key component of the value-investing financial strategy. A Technical analysis, on the other hand, attempts to use stock charts to predict a stock's price evolution. Technical analysis suits short term trading with its use of recent, short term price movements. Some experts view fundamental and technical analysis as polar opposites: fundamental analysis for investments, technical analysis for trading. However, some investors have combined fundamental and technical analysis to great effect.

Fundamental analysts look at company data that spans a number of years. Unlike technical price data, items like quarterly reports and price to earnings ratios are not instantly available. Fundamental analysis revolves around the idea of a security's value; a security can be undervalued or overvalued, according to this school of thought. By determining the value of financial instruments, fundamentalists decide what investments to make.

Technical analysts examine a security's price movements, looking at data from the current week, day, or even minute. Technical charts possess recent data about price fluctuations, the volume of shares in trading, and mathematical trends formed by graphs. The trends in graphs are not always obvious either. In finance, an uptrend is defined in terms of the "highs and lows". For example, one low can't be lower than the previous low, or else the trend is considered a reversal. Analysts try to use chart trends to predict movements in the stock exchange; the price of a security is more important than the concept of value, according to the technical analysis school of thought. Technical analysis helps to determine the "correct" time to enter a security (http://www.investopedia.com/university/technical/techanalysis2.asp).

3.4 Dogs of the Dow

The "Dogs of the Dow" investment strategy revolves around the Dow Jones Industrial Index. An investor selects ten stocks from the Dow Jones with the highest dividend payments and the lowest prices. The idea behind this strategy is that the Dow only possesses strong, reliable companies that will rebound as the year progresses; assuming this is true, an investor should be able to make a profit by having the "dogs" in his portfolio.

The companies within the Dow Jones index are usually stable and fully developed, causing changes in stock price to be gradual. An investor needs to commit to the long term nature of the strategy for it to be effective; the idea of selling the stocks quickly might be appealing if the stocks don't increase in value immediately. Companies in the Dow do have the potential to fail, so preliminary research is still beneficial.

3.5 Value Investing: An Overview

Value investing is an investment style created by Benjamin Graham and David Dodd, a style that became popular in 1934 with the publication of *Security Analysis*. A value investor looks at a security's underlying value using fundamental analysis, usually to determine if the security is under-priced. Fundamental analysis investigates both qualitative and quantitative factors, including earnings, capital, the price to earnings ratio, management quality, dividend yields, etc. A firm's underlying (intrinsic) value is thought to be independent of stock market pricing; as Warren Buffet stated, the idea is to "find an outstanding company at a sensible price."

As a result of speculation, securities have often traded at prices far above their intrinsic values. Corporations with high growth or an innovative product attract investors, pushing a security's P/E ratio to a level that can't be justified by the company's earnings. As with many speculative bubbles, hype can drive a security's price high as investors believe that it will continue to rise; eventually, however, the stock plummets to a price closer to the intrinsic value. On the other hand, some securities have prices below their intrinsic value; the price does not reflect the company's potential. This school of thought supports a weak interpretation of the efficient market theory (discussed above), where the market allows an investor to take advantage of price imbalances. Value investors buy under-priced securities with the expectation that the company's performance, and thus stock price, will rise.

A thorough value investor spends a significant amount of time looking at company profiles, annual financial reports, and a variety of other resources in order to determine the intrinsic value of a company. Careful research is necessary to detect a good, or bad, company; some companies try to hide inefficient or unethical management, as was seen with the Enron scandal. When looking at an annual financial report, items to consider include the Price to Book ratio, the Price to Earnings Ratio, cash flow, the beta number, revenue, etc. Generally, favorable signs include an increase in earnings and cash flow, a P/E that isn't highly inflated (~15 is the market average), consistent dividend yields, a price to book ratio lower than 1.5, etc. These values are conservative indicators of potentially good securities; an experienced investor may pick a security that doesn't strictly obey value investing theory. However, novice investors can use these values when initially screening a group of stocks.

3.6 Growth Investing

Growth investing is an investment style that is in many ways opposite to value investing, despite the fact that they both consider the intrinsic value of a security. A growth investor looks for stocks, or other investment vehicles, with above average growth; a stock might be appealing even if it has relatively high PE and price to book ratios because the growth potential is what is considered. However, this style has become less popular after the recent technology bubble, in which the NASDAQ index plummeted despite investors' hopes. High growth stocks can still be part of a well diversified portfolio without introducing too much risk; the problem lies in "placing all the eggs in one basket."

3.7 Ten Laws of Technical Trading (http://stockcharts.com)

John Murphy outlined ten key elements involved in technical trading, items that I will consider carefully when developing my technical analysis portfolio.

1. "Map the Trends"

   Technical trading begins with identifying market trends. A technician often looks at monthly and weekly charts spanning several years in order to recognize long term trends. Once the main trend has been found, intra-day charts can be used to make short term trading decisions.

2. “Spot the Trend and Go With It”

   Several trend sizes exist (long-term, intermediate, and short-term). Investors should choose a trend and trade in its direction. Different trends require different charts. For example, an intermediate trend would require the use of daily and weekly charts, while a short-term trend would use daily and intra-day charts. For this project, daily and weekly charts are appropriate; weekly charts will be used to identify an intermediate trend and daily charts will be used to determine the timing of trades.

3. “Find the Low and High of It”

   Support and resistance levels should be identified next. The support is the price level at which demand always exceeds supply, preventing the price from falling below that price. Contrarily, the resistance level signifies the point at which the incentive to sell exceeds the incentive to buy, preventing the price from rising. While the price of a security generally remains within these boundaries, a breakout might occur. A breakout is when a security rises above the previous high or dips below the previous low, going outside of the support and/or resistance levels. The old support level can become the new resistance, or the old resistance level can become the new support. Generally, the best place to sell is near the resistance and the best place to buy is near the support because the price is expected to bounce around between the boundaries. An example of support and resistance can be seen in Figure 3.1 below.

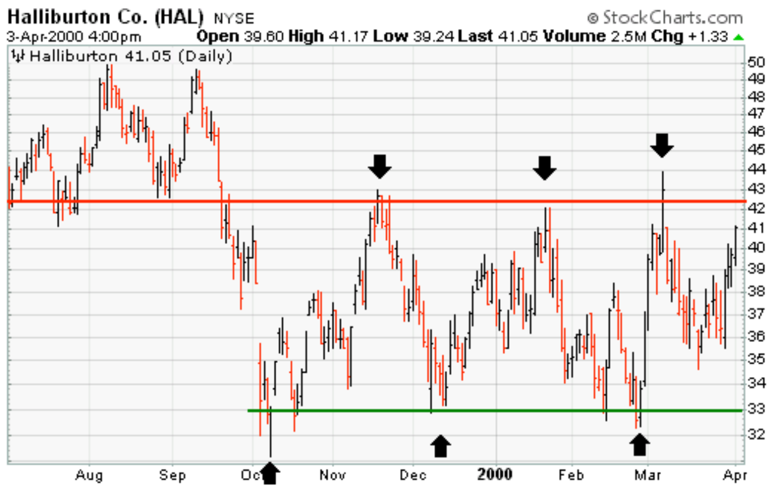

Figure 3.1: Support and Resistance Levels

4. "Know How Far to Backtrack"

    Market corrections occur as the price goes up and down relative to the main trend. These changes, referred to as retracements, are usually viewed as percentages. Retracements usually range from a one-third change to a two-thirds change, with a fifty percent retracement being the most common. An investor can predict the behavior of a market correction in order to find the best time to buy on an uptrend.

5. "Draw the Line"

    Trend lines should be drawn. Uptrends are drawn by connecting two successive lows, while downtrends use two successive peaks. The price of a security often "pulls back" to the trend line while the trend continues. Also, the price should intersect the trend line at least three times to be considered valid. The longer a valid trend line becomes, the more significant the trend; a break in the trend line usually signifies the end of the trend.

6. “Follow That Average”

Moving averages relate to trend momentum and offer buy and sell signals. Investors look at moving averages to tell if a trend is still in motion, or to confirm that a trend has ended. However, moving averages do not warn about a trend change in advance; they are useful after a shift has occurred. Investors use a combination of two moving averages to find trading signals. Some combinations include: 9 and 18 day, 4 and 9 day, and 5 and 20 day averages. The short-term line sometimes crosses the long-term line, indicating a shift in momentum.

7. “Learn the Turns”

Oscillators help to identify when the market is on the brink of change, when a market is either overbought or oversold. The two most popular oscillators are Stochastics and the Relative Strength Index (RSI). Both indicators operate on a scale of 0 to 100. Each scale has values that point to the market being oversold or overbought: 20 and 80 for stochastics, 30 and 70 for RSI, respectively. Oscillators are useful for short term trading. Weekly signals relate to daily changes, while daily signals are used for intra-day charts.

8. “Know the Warning Signs”

The Moving Average Convergence Divergence (MACD) indicator borrows elements from both moving averages and oscillators. A buy signal occurs “when the faster line crosses the slower line and both lines are below zero.” A sell signal appears when the “faster line crosses below the slower from above the zero line" (stockcharts.com). Furthermore, a MACD histogram plots the difference between the lines using vertical bars. The histogram gives early warnings of trend changes.

9. "Trend or Not a Trend"

   The Average Directional Movement Index (ADX) helps an investor tell whether the market is in a trend or in a trading phase. Represented by a line, a rising ADX implies a strong trend while a falling ADX suggests that there is no strong market trend. Also, the state of the ADX influences whether an investor uses moving averages or oscillators; an investor would not use moving averages in the absence of a trend. The ADX helps with picking a trading style, as style is heavily influenced by the market environment.

10. "Know the Confirming Signs"

    Volume and open interest are also indicators. A heavy trading volume should complement the recognized trend. For example, heavy volume should be seen on "up days" when the market is on an uptrend. This heavy volume indicates that there is a rising open interest in that security. However, if low volume accompanies an uptrend, even on up days, interest is probably waning; the trend is probably coming to an end.

3.8 Technical Analysis: Charts

Technicians generally believe that beating the market revolves around the study of price. Based on the efficient market theory, the price of a security accurately reflects all of the information available about a company or an instrument; with the internet, a stock's price changes almost immediately as new information is brought to light. With this in mind, many technicians comfortably ignore values and considerations associated with fundamental analysis. The study of price changes begins with the use of various charts.

A variety of charts are used by technicians to analyze price movements, including candlestick, line, bar, and point & figure charts. Each chart has a different way of representing price changes, and some charts have more information than others. A line chart, for example, plots closing prices with a line; sometimes it is useful to ignore intraday price swings when recognizing trends. A bar chart represents the high and low price with a vertical line, indicating the closing price with a horizontal line (can represent open and close with a split horizontal line), as figure 3.2 shows. The candlestick chart represents the high, low, open, and close; the open and close are represented by a box, and the high and low prices are represented with a lines perpendicular to the box. I have decided to use candlestick charts because they are easy to read and offer data about intraday price movements.

Figure 3.2: Bar Chart Example

Stock charts, specifically Moving Average Convergence Divergence (MACD) charts, have several ways to predict trends in price movement and price momentum. Figure 3.2 shows an example stock chart that contains Bollinger bands, 26-day, 12-day, and 9-day moving averages, the MACD line, the trigger line, and the MACD-histogram. The moving averages are used to analyze the momentum of a security, while the Bollinger bands measure volatility. The MACD-histogram compares the 9-day moving average, represented by the trigger line, to movements in the graph. Using several techniques, technicians use these indicators to identify different patterns.

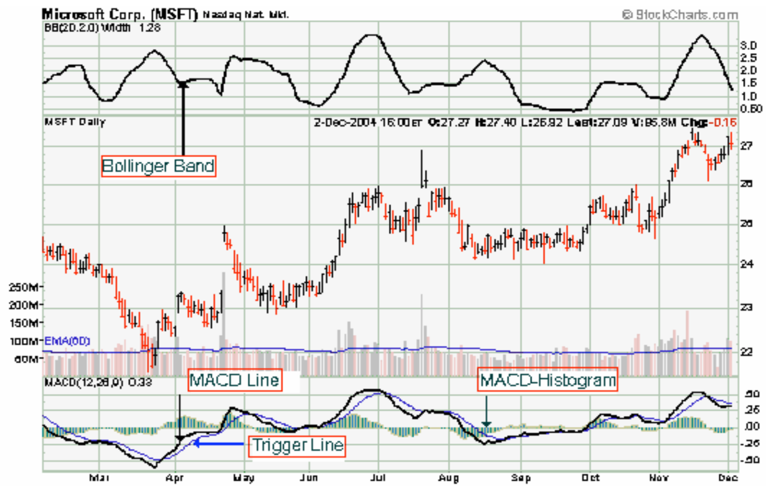

Figure 3.3: Microsoft Corporation, chart breakdown

A key indicator on the MACD graph is the trigger line, which is used to detect a change in the direction of price movement. When the MACD line moves from below the trigger line to a position above it, it is referred to as a “bullish crossover”. As you can see, a bullish crossover tends to correspond to an upward trend in the MACD graph. Contrarily, a bearish crossover is when the MACD line dips beneath the trigger line, which usually means that the security price will dip. This indicator does not always predict the movement of the graph, but it is an important for recognizing general trends. One of the issues with this approach is that by the time a shift in the trend is realized, investors can not respond quickly enough to take full advantage of the rise, or drop, in price.

In technical analysis, “false signals” are also possible. Sometimes a technician recognizes a bullish or a bearish crossover, only to observe that the market trends in the opposite direction. The MACD line usually corrects the false signal, probably after the investor has bought shares in the security; this rapid reversal of signals is referred to as a "whipsaw". An investor may sell a stock prematurely due to the whipsaw effect.

To avoid false signals, a technician looks at the MACD histogram. The histogram approximates the momentum of the trigger line rather than the graph, making it easier to determine if a crossover is true or false.

Bollinger bands measure volatility, which is usually expressed in a percentage; volatility refers to how much a security's price changes over a given period of time. A security that, for example, triples in price in a day would be considered highly volatile. Volatility increases risk, which means that the investor can either make or lose a lot of money in a short period of time (www.stockcharts.com).

3.9 Dow Theory

Charles Dow developed the Dow Theory in the late nineteenth century through the analysis of market price action. William P. Hamilton, editor of *The Wall Street Journal*, later refined the theory through a series of business articles and editorials. In 1932, Robert Rhea articulated the Dow Theory by collecting the writings of Hamilton and Dow, forming a cohesive set of assumptions in his book, *The Dow Theory*. Many of the assumptions about market behavior covered by the theory still apply to modern business dynamics.

The Dow Theory attempts to explain market behavior with a focus on technical analysis and sector comparison; many of the assumptions within the theory are considered axioms of Wall Street. The first assumption is that the primary market trend can not be manipulated. The market is considered too large to be affected as a whole, despite the efforts of a corporation or individual. However, the theory does consider the manipulation of individual stocks to be possible. The release of a rumor or the presence of new information can cause a stock to sharply rise or fall, temporarily. Eventually, the main trend should prevail; the stock manipulation should not derail the entire market.

The difference between the primary trend and individual stocks relates to market movements. The Dow Theory delineates three different types of market movements: primary movements, secondary movements, and daily fluctuations, also referred to as short swings. Primary movement is synonymous with main trend, a phase that can last up to several years. Secondary movements run opposite the primary trend and are considered reactionary movements. As a result, these movements (retracements) are called corrections or reaction rallies. Corrections are viewed as a percentage of the main trend, usually varying between one third and two thirds of the trend. Figure 3.4 below illustrates a typical retracement. Lastly, the daily fluctuations of the market are hard to predict and are prone to the influence of rumors. Investors can easily be misled by price movements that occur over a day or two. However, short-term price movements can be useful when grouped together; investors can use daily charts to develop a better view of the market as a whole.

Figure 3.4: Retracement example

The Dow Theory also describes three phases associated with bull and bear markets. A bull market begins with an accumulation phase: investors “in the know” pick up securities with low valuations and high potential. Pessimism prevails during this phase and most investors are unaware of the new uptrend. Eventually stock prices rise as business conditions improve and investor confidence begins to return. Investors who follow trends begin to invest at this stage. The bull market finally reaches excess as speculation creates inflated prices and public interest peaks. A popular saying is “When the taxi cab drivers begin to offer tips, the top cannot be far off” (http://stockcharts.com). Similarly, a bear market operates with three progressive phases of selling rather than buying, with pessimism replacing optimism. This market model implies that there is a lag between the market trend and the actions taken by the majority of investors; the most insightful investors, like Warren Buffet, catch the trend at or near its start. Even then, no investor has completely mastered the market and there is no guaranteed route to success.

Furthermore, the Dow Theory discusses the relationship between the Dow Jones Industrial Average (DJIA) and the Dow Jones Transportation Average (DJTA). When industry is on the rise, more goods are produced, and thus more goods will be shipped. It follows that the averages should move in the same direction; if the averages diverge, the market is probably going to change as one average follows the other.

The Dow Theory is useful when considering technical analysis, but it has several major criticisms. One criticism is that the Dow Theory is not very profitable relative to other investment strategies. Alfred Cowles conducted a study in which the Dow Theory was compared to a buy-and-hold strategy that uses a well diversified portfolio. The buy-and-hold strategy had an annual return of 15.5% versus a 12% return with the Dow Theory, but it was also riskier and more volatile. Critics also claim that the Dow Theory is "late", meaning that an investor loses potential gains in waiting for a solid trend to appear. Finally, the relationship between the DJIA and the DJTA isn't considered that reliable, especially with modern technology and the internet; transportation has been changed, perhaps weakened, over time.

In conclusion, the Dow Theory is useful because it identifies the more tangible elements of technical analysis: the trend, market movements, and market phases. The concepts developed by Dow and Hamilton can be used in conjunction with other technical analysis strategies, like the Elliot Wave theory (stockcharts.com).

3.10 Elliot Wave Theory

Ralph Nelson Elliot developed the Elliot Wave theory in the late 1920's after recognizing repetitive cycles in market behavior. He discovered that market movements followed trends in investors' reactions, reactions that followed principles of "mass psychology". Elliot claimed that price movements occurred in wave patterns, and that each wave had a wave pattern within it; this is similar to fractals in mathematics, shapes that are formed by a repeating pattern that can be found no matter what scale the image is viewed at. According to the theory, each price movement is followed by a reactionary price movement. Five waves move in the direction of the prevalent trend, followed by three corrective waves (www.investopedia.com). This 5-3 pattern can be viewed in Figure 5, below.

Figure 3.5: 5-3 Wave Pattern

It follows that each of these movements has waves within them, which also follows the 5-3 pattern. This can be seen below, in figure 3.6.

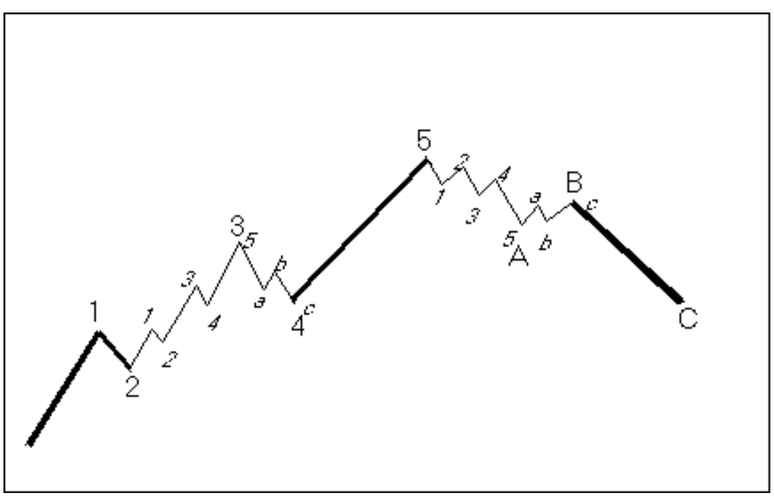

Figure 3.6: Wave Pattern within a Pattern

The pattern becomes more elaborate as price movements are compared to the Fibonacci sequence in mathematics. Patterns are also applied to the size of the corrective movements, with an emphasis on the golden mean (stockcharts.com).

4 Simulation Analysis

4.1 Buy Cases:

Axis Capital Holdings Ltd.

Pros:

1. Axis Capital Holdings has well-developed communications systems that allow for better underwriting, the process of determining customer eligibility for financial products.
2. The board of directors is shareholder friendly and has a considerable amount of experience in financial regulation. Ten out of the twelve board directors are independent.
3. AXS is located in Bermuda and has fewer taxes, thus profitability is increased.
4. AXS focuses on specialty insurance including terrorism, war, and catastrophe insurance, setting it apart from competitors.

Cons:

1. The reinsurance of catastrophes is a volatile business that can cost investors.
2. Competitors are emerging
3. The profitability of underwriting is expected to downtrend

Conclusion: AXS has solid business mechanics, but the nature of its business makes it an asset with high uncertainty. The stock should be carefully watched to see how it responds to an increase in competition. Recent growth tips the scale in favor of "buy"; the risk of this stock's volatility is lessened in a diversified portfolio.

Becton Dickinson and Company (BDX)

Pros:

1) Becton Dickinson and Company has had three fiscal quarters of internal growth, with year-over-year internal growth rates of 12.7%, 7.8%, and 9.8% respectively (Morningstar.com). With previous solid returns, growth is expected to continue, especially with increases in government medical spending.
2) Becton has had a history of investing money wisely, and is now investing in genetics and oncology research. Recent product developments, including "staph infection detection technology", are expected to drive growth, especially with new hospital regulations mandating the detection and reduction of infections. Involvement in diagnostic and bioscience ventures looks promising.
3) Becton has had previous advancements in medical technology that were adopted by the U.S., as well as by developing countries. Becton's safety-engineered products are expected to be a reliable source of cash flow; with several major global manufacturing plants, perhaps Becton can overcome competition.
4) BDX has been kind to its shareholders, with a record of positive returns and increasing dividends. The company continues to raise its dividends (Morningstar.com).

Cons:

1) Hospitals, affected by the economic crisis, may reduce unnecessary spending. As a result, Becton's lab ware division might suffer.
2) Becton is a defendant in several lawsuits involving Becton's medical products. The company might suffer a financial blow if their insurance doesn't provide full liability coverage.
3) Diabetes sales are threatened by competitors, who may begin packaging insulin with insulin dispensers.
4) Becton's manufacturing operations require the use of oil resin; high oil prices might be passed onto customers, negatively affecting business (Morningstar.com).

Conclusion: BDX looks like a solid buy when considering their history of high dividends and returns. The company has an extensive infrastructure that revolves around needles and similar commodities; their operations are established across the globe. However, rival companies threaten the growth of several of Becton's product divisions; the saturation of the needle market comes to mind. Furthermore, Becton might suffer a financial blow from class-action lawsuits. Hospital spending seems to be on the rebound, but Becton might experience stunted growth. The company needs to be watched carefully to make sure that the research divisions grow as expected. Hopefully Becton's size increases its economic moat.

Activision Blizzard (ATVI)

Pros:

1) Activision merged with Blizzard, a company that offers expertise in massively multiplayer games and real time strategy games.
2) Growth is expected to rise as the company puts out more hit franchises. The game "Call of Duty: Modern Warfare 2" was one of the best selling games of all time. Successful franchises have led to positive cash flow and a lack of debt.
3) The company's franchises consist of sequels or trilogies, boosting revenue. "Starcraft 2", the sequel to the immensely popular "Starcraft", is scheduled for July 27th.
4) A ten year deal with Bungie could propel the company's growth even further.

Cons:

1) The popular guitar hero franchise has peaked, reducing growth in the music-based games genre.
2) Developers from Infinity Ward have formed a rival company with the support of Electronic Arts, creating more competition.
3) Activision Blizzard creates games that use licensed content, while self-published video games are becoming more and more popular.

Conclusion: ATVI has solid growth and positive cash flow due to its hit franchises, including "Call of Duty" and "World of Warcraft". Games like "World of Warcraft" are appealing because of their subscription service; this type of business arrangement is highly profitable, especially with millions of subscribers. Activision Blizzard is mainly threatened by competition, which increases as companies attempt to imitate Blizzard's success. Growth may stall due to this competition, but the imminent release of a hit game may cause a short-term peak.

Johnson & Johnson (JNJ)

Pros:

1) Johnson & Johnson is a leader in the health care industry; a large percentage of their products dominate their respective markets. Competition is not a significant threat.
2) The aging baby boom generation should increase health-care needs, boosting product demand.
3) The company has a robust research department that produces next-generation products.
4) The company issued a $10 billion share-repurchase; this investment is a sign of financial confidence.

Cons:

1) Several of Johnson & Johnson's patents will expire in the near future, which will introduce extra costs in the short term.
2) The company has had to recall around 200 million bottles of Tylenol and other medicines due to manufacturing problems. Damage to the company's reputation and FDA action could set the company back somewhat.
3) Health care reform ("public plan option") might affect product pricing and demand, thus limiting the company's pricing power.

4) The drug Invega was developed to treat schizophrenia, but it has performed more poorly than expected.

Conclusion: Johnson & Johnson has a few obstacles to contend with: patent expirations, FDA approval issues, product recalls (more damaging to reputation than revenue), the potential effects of health reform, and generic drugs that compete with Topamax and Risperdal. I am confident that the company's research, which is already turning out new pharmaceuticals and surgical devices, will lead to future growth. The company is a leader in the industry, so it should be able to recover from any temporary setbacks. Given a long enough time frame, I would expect the return on this stock to be quite high; JNJ seems like a value stock, as it is an excellent company in a slump.

Abbott Laboratories (ABT)

Pros:

1) The Xience stent was analyzed in several studies that favored it over many in-house stents, as well several rival stents; stent sales are likely to increase.
2) Abbott Laboratories has strong diagnostic, nutritional, and pharmaceutical divisions, with a cardiovascular group that is growing quickly. Future growth is projected.
3) The company has made some acquisitions: Solvay's pharmaceutical unit and Piramal's drug unit. These units come with new drugs, and Piramal's unit offers entry into the expanding Indian market.

4) Humira may have applications towards Crohn's disease and psoriasis, increasing its sales growth.

Cons:

1) Abbott Laboratories has recently acquired Advanced Medical Optics, as well as the previously mentioned drug units. New acquisitions can be difficult to integrate and make profitable.
2) The profitability of the new drug-eluting stents like Xience may decrease as some studies find that they are not advantageous.
3) The company's product pipeline is relatively weak and new product approvals may fall short of success.
4) Humira, one of ABT's leading drugs, may find a rival in Pfizer's JAK-3 inhibitor, a drug that targets the arthritis market (Morninstar.com).

Conclusion: Abbott Laboratories is poised for growth with its recent acquisitions and with the projected success of Xience and Humira. Its product pipeline is small compared to rivals, so growth will depend heavily on new product candidates. Like Johnson and Johnson, ABT is involved with several diverse medical operations that protect it from dips in the pharmaceutical market. As long as Xience and Humira hold up, the company should be able to handle the integration of new divisions; given enough time, the stock should appreciate.

ExxonMobil Corporation (XOM)

Pros:

1) ExxonMobil acquired XTO Energy on June 25th, 2010, making it the largest producer of natural gas in the United States (Morningstar.com). XTO offers expertise in harvesting unconventional resources, which will be even more profitable when combined with ExxonMobil's proficiency in financial and operational management.
2) National Oil Companies (NOC's) will need the help of a partner firm, such as ExxonMobil, to extract and use natural resources.
3) XOM focuses on shareholder returns with repurchases and high dividends. "Over the past five years, Exxon paid $39 billion in dividends and repurchased $135 billion worth or stock, reducing shares outstanding by 23%" (Morningstar.com)
4) ExxonMobil is a leader in the industry with extensive global operations. The company has reached near-maximum expansion and looks to the NOC's as one of the final international frontiers. Extensive, diverse operations shield ExxonMobil from a dip in commodity prices or a dip in the economy.

Cons:

1) The size of the company limits growth, especially when some NOC's attempt to shelter their resources from outside influences. Nationalism reinforces the tendency to keep oil and other resources within a country's control.
2) Profits will fall as commodity prices fall; record-high commodity prices suggest that the price level is at or near its peak.
3) Partnerships with NOC's could lose their profitability as commodity prices slip, nullifying recent international efforts (Morninstar.com).

Conclusion: The company is solid: it's a leader in the industry, it has a history of efficient capital allocation and management, and its recent acquisition looks promising. A slip in the price of commodities threatens the industry as a whole, but ExxonMobil is shielded by operations across the globe. ExxonMobil is an industrial giant, making it a "safe bet" in the energy sector.

Seaspan Corporation (SSW)

Pros:

1) Seaspan uses long-term fixed-rate contracts that provide a steady flow of cash, sheltering the company from the volatile shipping industry.
2) By locating in the Marshall Islands, SSW avoids income taxes.
3) The price of vessels has decreased overall, which fits into Seaspan's plan to dramatically expand its fleet from 10 to about 70.
4) Many shipping companies are looking to put more vessels into the water, which would probably affect shipping rates negatively. However, many companies have struggled with expansion due to a lack of funding, which in turn prevents the seas from becoming overcrowded.

Cons:

1) Seaspan only has a small number of clients; losing one would hurt revenue significantly.
2) Demand for shipping via containers may decrease as China experiences a decrease in trade, or if additional trade barriers arise.

3) The company issued stock in 2009 and raised a significant amount of capital. However, the issuance dilutes the price of shares, hurting shareholders.
4) To fund the expansion of the fleet, Seaspan may be forced to issue even more equity, which will further dilute share prices.
5) Seaspan has several anti-takeover policies that limit shareholder gain in the case that Seaspan is acquired (Morningstar.com).

Conclusion: Seaspan is vulnerable due to the fact that it only has a handful of customers. At one point, one customer was responsible for fifty percent of the company's revenue (Morninstar.com); Seaspan would be hurt tremendously if such a partner decided to switch companies (shipping industry is highly competitive). Also, Seaspan might not be able to fund the expansion of its fleet. This stock is uncertain in a highly competitive, volatile industry. Growth seems to depend on the company's ability to expand and maintain its long-term fixed-rate contracts. While risky, Seaspan's expansion efforts seem to be going smoothly. Based on Morningstar's valuation, Seaspan should be a good value stock, assuming that no funding issues develop.

4.2 Technical Analysis

VZ

The technical analysis of Verizon Communications began on July 8th, 2010 and runs until August 1st, 2010. Figure 4.2 is divided into five components: the Relative Strength Index, the candlestick chart with two moving averages, the volume chart, the MACD chart (with histogram), and the full Stochastics indicator. Weekly charts were used to identify the overall market trend, while daily charts were used to analyze short term trends in a stock's price movements.

Figure 4.1: Verizon Communications SharpChart

The RSI indicates how overbought or oversold the stock is; the stock becomes more overbought as the band approaches the upper boundary and oversold as it approaches the lower boundary. As one can see, the stock began to dip in early April and entered a downtrend that lasted until early June. The RSI was located closer to the lower boundary (oversold) during this period.

In early July I noticed several signals that indicated an uptrend. Firstly, the faster moving average crossed the slower moving average on the MACD as the two averages rose above zero. This was accompanied by a spike in trading volume and a peak in the stochastics indicator. Most of the signs pointed to the beginning of an uptrend, creating the incentive to buy. More recently, the market is showing signs of improvement as companies are dealing with the recession. The last month, which was marked by pessimism, creates an opportunity to find value stocks.

Media Highlights:

July 6th, 2010

TheStreet.Com

"Verizon Deal Drags Down Frontier Stock": Frontier is a phone company with a focus on small towns and rural areas. They recently bought 4.1 million access lines from Verizon for 8.6 billion dollars in a cash and stock deal. With this deal, Verizon shareholders receive 1 share of Frontier for every 4.2 Verizon stocks they own. Many Verizon shareholders opted to sell their frontier stock, which resulted in a decrease in the price of Frontier's stock.

Verizon stock was in decline; when looking at the big picture, VZ was in between and downtrend and the current uptrend

July 15th, 2010

New York Times

"Even Without iPhone, Verizon is gaining on AT&T": Consumers anticipate the combination of Verizon, the biggest cell phone carrier in the US, with the Apple iPhone. However, this partnership may be less likely as Verizon becomes closer to Google, producer of the Android operating system. Verizon may also be reluctant to acquire the iPhone because of the business conditions set by Apple. For example, iPhone application profits go entirely to Apple, with AT&T excluded; Verizon may not be comfortable making concessions like this.

While the partnership between Apple and Verizon is uncertain, Verizon is doing well, increasing its share of the smartphone market. Despite the pull of the iPhone, Verizon is successfully rivaling AT&T.

July 24th, 2010

Wall Street Journal

"Verizon Wireless Gains Outpace AT&T": Verizon added more customers to its wireless branch in the second quarter than AT&T, with 665,000 and 496,000 contract customers added, respectively. Verizon's success has been attributed to the late release of the iPhone 4; AT&T's numbers are expected to rebound in the third quarter. In addition, 53% of AT&T subscribers have a smartphone or messaging device, compared to 35% for Verizon. Despite AT&T's current advantage, Verizon is continuing to improve its position in the wireless market.

August 3rd, 2010

Wall Street Journal

"'Pay as You Go' Takes on New Meaning": AT&T Inc., Verizon Wireless and T-Mobile USA are joining forces to explore a mobile payment system that uses cell phones. With this service, customers would be able to hold their cell phones up to payment terminals to conduct a transaction. The contact-free system would involve small chips or radio transmitters that communicate with the payment terminals. The problem with this proposal is that the chips are expensive, and the demand for this system is not high in the U.S. Industry leaders are making efforts to adapt this new technology, a technology that should prove highly marketable.

MCD

The analysis of McDonalds Corporation began on July 8th, 2010 and runs until August 1st, 2010. As you can see in Figure 4.3, McDonalds Corporation has been in an uptrend for the past five months, experiencing a price drop in late May/Early June. I decided to buy the stock on July 8th after noticing a crossover signal on the MACD chart and a swing from oversold to overbought with the stochastics indicator.

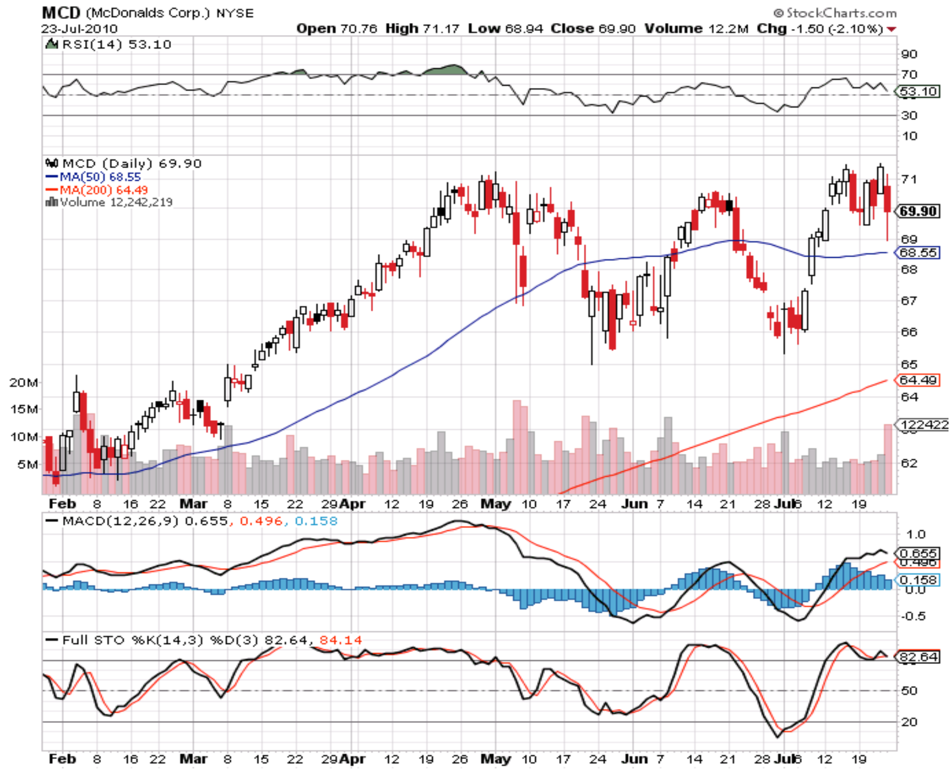

Figure 4.2: McDonalds Corporation SharpChart

However, the RSI is hovering near the upper boundary and the stochastics indicator is over 80. The stock seems to be entering a trading phase with no definite uptrend or downtrend. Also, the latest price increase was not complemented by a spike in trading volume. The stock seems to be near its peak and I anticipate more sell signals to be appearing within the next week.

Media Highlights:

July 2nd, 2010

Wall Street Journal

"McDonald's Cuts Aggressive Smoothie Promos Ahead of U.S. Launch": Smoothies are a recent addition to McDonalds' growing beverage line. McDonald's restaurants have been promoting smoothies aggressively, and executives are concerned that demand will outweigh the available supply upon launch, scheduled for July 13th. Some restaurants have sold the drink without permission; the company, however, wants sales to begin with the backing of a national smoothie advertising campaign. In addition to smoothies, McDonald's restaurants now serve frappes and espressos, all of which are expected to boost revenue.

July 7th, 2010

Wall Street Journal

"McDonald's Blasts Criticism of Happy-Meal Toys": A consumer group criticized the use of toys to market happy meals and threatened to sue the company, provoking a firm response from the McDonald's Corporation. McDonald's chief corporate executive Jim Skinner wrote a letter to the group, strongly defending the use of toys in Happy-Meals.

July 30th, 2010

Wall Street Journal

"Bonds Soar to Rare Heights": A global boom in the corporate-bond market has created an incentive for corporations to borrow money. Investors continue to pile money into corporate bonds, creating interest rates that are historically low. McDonald's raised 450 million dollars in debt, money that can be used to promote growth. No one is certain about how long the boom will last, but companies are taking advantage of the opportunity to borrow and refinance.

TRV

The analysis of The Travelers Companies Inc. began on July 8th, 2010 and runs until August 1st, 2010. Figure 4.4 illustrates that the company experienced a downtrend that began in late March and ended in early June. I noticed that the faster moving average crossed the slower moving average in early June, pointing to a possible uptrend. The stochastics indicator suggested that the stock was overbought, and the RSI was stable, hovering around the average.

Figure 4.3: The Travelers Companies Incorporated SharpChart

While the stock appears to be between trends, the fast moving average on the price chart dipped below the slow moving average, possibly indicating a downtrend. This negative signal is not confirmed by the other indicators, so a sell is not warranted at this point. I will wait for more sell signals to form before I decide not to hold the stock.

Media Highlights:

July 9th, 2010

Market Intelligence Center

"Alert: The Travelers Companies (TRV) Showing Bearish Price Movement": Travelers stock has a support around 49.28 and a resistance around 50.56. Technical indicators suggest a bearish trend, even though the stock has a strong standing on the S&P 500. The stock also appeared on the Investors Observer Leaders List.

July 22nd, 2010

Market Watch

"Travelers cuts outlook as profits comes up short": Travelers reported a second quarter profit of $670 million, compared to $740 million during the previous year. Sales increased 1% to $5.69 billion. Rather than reaching the projected $5.70 a share, the company had a range of $5.20 to $5.45 a share, which calls for a reassessment of the stock.

Wall Street Journal

“Storm Claims Hit Travelers’ Profits”: Travelers suffered losses due to a wave of inclement weather: hailstorms in Oklahoma, thunderstorms in Michigan, Ohio, and Illinois, and floods in Tennessee. Catastrophe costs and disappointing profit margins have hurt Travelers. Furthermore, weather authorities predict that an active hurricane season will occur in the third quarter, a threat that hurts Travelers’ dwindling appeal.

July 29th, 2010

Market Intelligence Center

“The Travelers Companies Inc. (TRV) Appears On The Investors Observer Volume Leaders List”: The technical indicators are still bearish as the stock appears on the volume leaders list. The support is around 49.77 and the resistance is approximately 51.07. The S&P still gives a strong buy rating (5 out of 5 stars).

MRK

The analysis of Merck & Company, Inc. began on July 8th, 2010 and runs until August 1st, 2010. Merck had a downtrend from mid March till late May, after which buy signals begin to appear. The stock began to rise in price around May 24th, 2010, accompanied by a crossover signal on the MACD histogram and a rise in volume. The uptrend has lasted into late July as sell signals begin to appear.

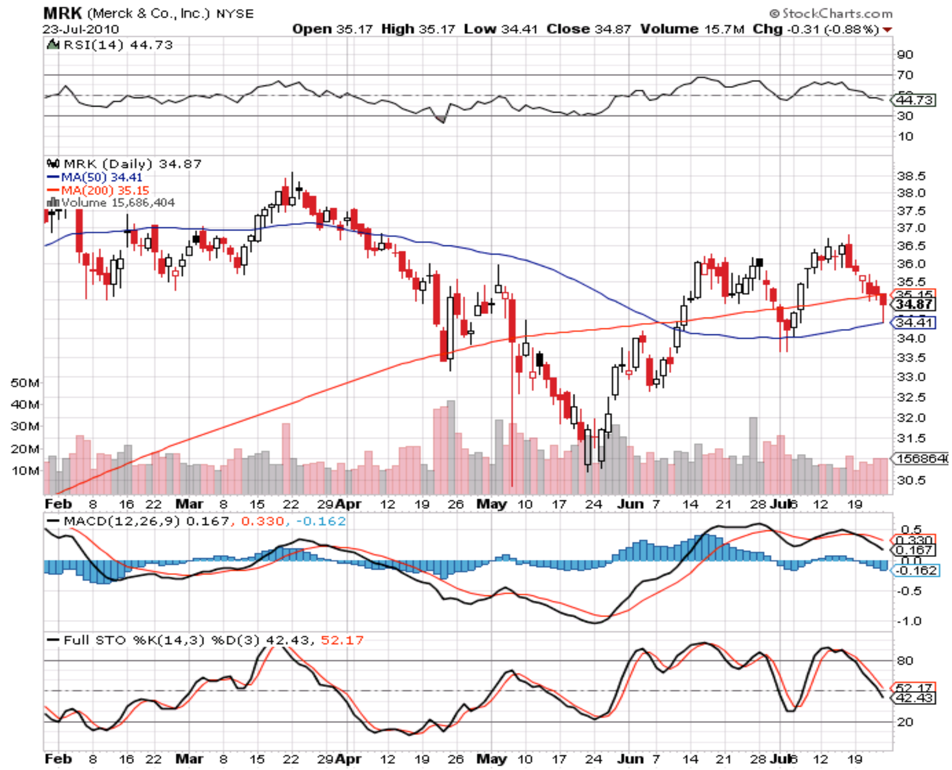

Figure 4.4: Merck & Company, Incorporated SharpChart

In late July I began to notice that the faster moving average dipped below the slower moving average, both on the price chart and the MACD. Furthermore, the stochastics indicator is above 80, indicating that the stock is overbought; the indicator seems to heading for oversold. The RSI is stable and the volume chart does not confirm the downtrend, but the healthcare business seems to be volatile. Having absorbed news about the healthcare industry, I would be willing to bet that the stock will downtrend in the face of competitors and patent expirations.

Media Highlights:

July 8th, 2010

New York Times

"Merck Plans Layoff of 15% of Workforce": Over the next two years, Merck is conducting a "global merger restructuring", which involves the closure of sixteen facilities and reduction of the workforce by 15%. The company has acquired Claritin, an allergy medication, as well as the Coppertone sunscreen brand. However, restructuring can and has interfered with the company's operations; downsizing is alarming, but it can be attributed to the volatile nature of the healthcare industry.

July 27th, 2010

Wall Street Journal

"Merck in Talks for China Partnership": Merck had a conference with China's Sinopharm Group Co. about the marketing of vaccines and Merck products abroad. Emerging countries have grabbed the attention of companies like Merck and Pfizer, who are battling for a better position in foreign markets. One of Merck's ventures involves creating the largest animal-health operations in the world.

July 30th, 2010

Wall Street Journal

"Merck Takes Hit From Merger": Merck reported a 52% drop in profits for the second financial quarter, a drop that's attributed to recent acquisitions. Sales rose to

$11.35 billion because of the merger, but that was shy of the $11.46 billion estimate. The company is also hurt by patent expirations, which affect the drugs Cozaar and Hyzaar. The company asserts that savings and profits will rebound in 2012 as the layoffs and acquisitions begin to pay off.

5 Post-Simulation Analysis

5.1 Value Portfolio Analysis

Axis Capital Holdings Ltd.

Initial concerns about the volatility of the insurance industry were eased by favorable returns. As you can see in table 4.1, AXS was sold at $31.72 per share, compared to $29.7 when the stock was bought, yielding a profit of $384.10. According to the second quarter report, Axis had an earnings per share (EPS) of $1.51, 33 cents above the analyst estimate of $1.18. The reported revenue was $842.4 million, well above the $727.56 million estimate (streetinsider.com).

Becton Dickinson and Company (BDX)

Becton Dickinson and Company offered favorable returns with a profit of $425.10. The stock was purchased at $67.23 and sold at $71.68, an increase of $4.45. Becton is an industry leader, so this success comes as no surprise; their safety-engineered products, successful campaigns (like the surgical blade platform), and large medical division give them an advantage in the volatile healthcare industry. I held onto this stock for an extra week to see how it performed, resulting in more profits.

Activision Blizzard (ATVI)

Activision Blizzard was bought at $11.38 and sold at $11.92 for a profit of $250.10. The company is an industry leader, with popular game titles like *Guitar Hero, World of Warcraft, Starcraft,* and the *Call of Duty* franchise. I bought shares of the stock as hype began to surround the release of *Starcraft 2.* The stock was sold right before a significant price drop; ATVI was hurt by weak retail sales and poor console sales.

Revenue fell 12.7% in the recent fiscal quarter, and share prices fell 6% (thestreet.com). As expected, the rise in stock price was short lived.

Johnson & Johnson (JNJ)

Johnson & Johnson was bought at $58.99 and sold at $58.53 for a loss of $65.90. The company has solid fundamentals, considering that it is an industry leader that dominates the consumer health market. Unfortunately, JNJ was set back by patent expirations, layoffs, and product recalls, which created a short downtrend. Had I held onto the stock for a few more days, I would have seen more positive returns.

Abbott Laboratories (ABT)

ABT was purchased at $46.19 and sold at $49.91 for a profit of $538.10. Abbott Labs is a leader in the nutritional products market and has the second largest global diagnostic division. Despite patent expirations, the company has done well due to the quick assimilation of recently acquired branches and a successful product pipeline. The healthcare industry has done well recently.

ExxonMobil Corporation (XOM)

ExxonMobil was bought at $57.10 and sold at $60.81 for a profit of $351.10. ExxonMobil is a "supermajor" petroleum company that is efficient at downstream refining and upstream exploration. Diverse, global operations shield the company from the volatility of questionable international ventures. The stock has been steadily rising as the recent market has been favorable.

Seaspan Corporation (SSW)

Seaspan was purchased at $9.99 and sold at $11.48 for a profit of $278.10. The company has, for the most part, matched the estimates of analysts; Seaspan reported a Q2 EPS of $0.23, 3 cents short of estimates (steetinsider.com). The company raised its dividend by 25% in late July as it reported increases in cash flow and opportunities to expand the fleet. However, the growth of Seaspan should be compared to competitors like Ship Finance International, who are also expanding. Competition and a slow global economic recovery may dampen Seaspan's returns.

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost	Profit/ Loss	Total Cash	Total Profit
7/1/2010	ABT	Buy	46.19	150	6938.45		93061.55	
8/2/2010		Sell	49.91	150	7476.55	538.1	100538.1	538.1
7/1/2010	AXS	Buy	29.7	200	5949.95		87111.6	
8/2/2010		Sell	31.72	200	6334.05	384.1	100922.2	922.2
7/1/2010	SSW	Buy	9.99	200	2007.95		85103.65	
8/2/2010		Sell	11.48	200	2286.05	278.1	101200.3	1200.3
7/1/2010	JNJ	Buy	58.99	100	5908.95		79194.7	
8/2/2010		Sell	58.53	100	5843.05	-65.9	101134.4	1134.4
7/1/2010	XOM	Buy	57.1	100	5719.95		73474.75	
8/2/2010		Sell	60.81	100	6071.05	351.1	101485.5	1485.5
7/1/2010	BDX	Buy	67.23	100	6732.95		66741.8	
8/6/2010		Sell	71.68	100	7158.05	425.1	101910.6	1910.6
7/1/2010	ATVI	Buy	11.38	500	5699.95		61041.85	
8/2/2010		Sell	11.92	500	5950.05	250.1	102160.7	2160.7

Table 5.1: Value Portfolio Performance

5.2 Technical Portfolio Analysis

VZ

As predicted, Verizon Communications did well in the recent market and offers decent returns. The stock was purchased at $26.50 and sold at $29.43 for a profit of

$859.10, the largest profit in the simulation. The stock has climbed recently with the announcement of the Droid 2 and the net neutrality issue that involves Google. As you can see in Figure 4.6, the MACD histogram indicates an uptrend and the moving averages seem to be converging. The RSI, however, indicates that the stock is overbought. The technical indicators are bullish, but the stock may peak in the near future.

Figure 5.1: Verizon Communications SharpChart

MCD

Two hundred shares of the McDonald's Corporation were bought at $67.81 and sold at $70.43 for a profit of $504.10. In my previous assessment of MCD, I asserted that the stock was not in a trending phase and that a short term dip was likely.

However, the RSI has been stable and McDonald's has maintained its advantage over the competition. Figure 4.7 implies that the stock has broken out of the trading phase and is possibly entering an uptrend (note that it ends on a peak).

The McDonald's Corporation is the largest fast food chain in the world with a large percentage of sales occurring overseas (wikinvest.com). While competitors like Wendy's and Arby's are in decline, MCD has benefited from highly successful beverage campaigns. Smoothie and Frappe sales have exceeded expectations as consumers look for healthier options (it is enough for an item to be perceived as healthy). The introduction of the Frappe, essentially a coffee milkshake, has taken a decent percentage of the premium coffee market-share from Starbucks. The smoothie market is small, but MCD hopes to make it more mainstream, as Starbucks did with coffee. With the addition of the new Angus wrap, MCD has created a more varied menu geared towards a wider consumer base.

Figure 5.2: McDonalds Corporation SharpChart

MRK

Three hundred shares of Merck & Company Incorporated were purchased at \$35.68 and sold at \$34.65 for a loss of \$328.90. The stock did not downtrend as predicted and seems to be establishing support and resistance levels between 33.5 and 36.5. Furthermore, a bearish crossover can be seen on the MACD, but there is not enough consensus between the indicators for me to predict a downtrend with confidence.

I should have expected a loss with this stock; while it was not a terrible pick, there were subtle signals in the media and in the stock charts that pointed to the company's weakness (short-term weakness, at least). For example, I had read that Merck had recently acquired Schering-Plough, a rival pharmaceutical company. Based on my research, acquisitions entail restructuring and can potentially affect management and sales. Merck then reported that the merger had resulted in a 52% decrease in profits, as well as the need for a reduction of their workforce by 15%. In addition, the company has a product pipeline that lacks diversity; patent expirations threaten the few "blockbuster" drugs that Merck relies on. While Merck is positioned to rebound due to the major acquisition, they are also weakened in the short-term. I realize now that this stock was not appropriate for such a short investment period.

Figure 5.3: Merck & Company, Incorporated SharpChart

TRV

Two hundred shares of Travelers Companies Incorporated were bought at $49.94 and sold at $50.92 for a profit of $176.10. I purchased the stock on July 8th during an upswing, weary due to the fact that the faster moving average (blue line) dipped below the slower moving average (red line). The stock did not move into a trend, and seems to be oscillating near 50.5. The MACD, RSI, and volume indicators imply that the stock doesn't have much momentum in either direction; I was content to sell the stock for a small profit.

Travelers profits mainly off of personal insurance and business insurance within the United States. The insurance industry is volatile, as a catastrophe can limit profits; natural disasters create claims, which cost insurance companies money. Fortunately, TRV has a good catastrophe model that allows it to profit even if a hurricane or other major event occurs. With a combined ratio of 85.9%, Travelers is ahead of the competition in terms of profitability (wikinvest.com).

Travelers is not without its flaws, as it reported a decline in revenue in the second financial quarter. In addition, Travelers has a lot of its money invested in Bonds, which are vulnerable to rising interest rates. Rival companies with more diversified portfolios exhibit more growth, relatively.

TRV is not a definite buy: 1) The stock does not exhibit a definite trend, and the technical indicators are not strong. 2) Recent storm activity threatens to cut profits, profits that are already waning. 3) Their portfolio is bond heavy; while the bond market is good right now, the company may suffer as interest rates increase. 4) A good catastrophe model results in relatively high profitability, one of TRV's redeeming qualities. Overall, the stock comes with a high amount of uncertainty.

Figure 5.4: The Travelers Companies Incorporated SharpChart

As you can see in Table 5.2 below, the technical portfolio was less diversified than the value portfolio, making it more vulnerable when one of its stocks drops in price.

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost	Profit/ Loss	Total Cash	Total Profit
7/8/2010	VZ	Buy	26.5	300	7959.95		92040.05	
8/2/2010		Sell	29.43	300	8819.05	859.1	100859.1	859.1
7/8/2010	MCD	Buy	67.81	200	13571.95		78468.1	
8/2/2010		Sell	70.43	200	14076.05	504.1	101363.2	1363.2
7/8/2010	MRK	Buy	35.68	300	10713.95		67754.15	
8/2/2010		Sell	34.65	300	10385.05	-328.9	101034.3	1034.3
7/8/2010	TRV	Buy	49.94	200	9997.95		57756.2	
8/2/2010		Sell	50.92	200	10174.05	176.1	101210.43	1210.43

Table 5.2: Technical Portfolio Performance

6 Conclusion

I conducted a ten week IQP that revolves around the observation and analysis of a stock investment simulation. After some extensive research, I decided to narrow my focus on the exploration of technical and fundamental analysis. The analysis required knowledge of many different aspects of investment; value stocks, growth stocks, efficient market hypothesis, the Dow Theory, etc. Based on this knowledge, I created two portfolios, one involving primarily fundamental analysis and one that used mainly technical analysis. I quickly realized that a comparison of two vastly different investment strategies was beyond the scope of this project; there are simply too many variables, and too little time, to try and prove the superiority of one approach. Some metrics to evaluate my performance include: profit versus loss, justification of my stock selection, the apparent understanding of the background material, and the degree to which I was able to time and predict market movements.

The simulation was a success from a profit versus loss perspective. My value portfolio had a +2.11% return and my technical portfolio had a +1.21% return (as of 8/2/2010). The total profit for the simulation was $3371.13, $2160.70 from the value portfolio and $1210.43 from the technical portfolio. I used approximately $40,000 for each portfolio (Value: $38,958; Tech: $42,243). While $100,000 was available for every portfolio, I thought that using the full amount was unnecessary, considering that the portfolio profits can not be compared directly. I can attribute my gains to the fact that the Dow Jones Industrial Average, as well as the S&P 500, are in an uptrend. Favorable market conditions made it easier to select stocks that would increase in value.

The stock selection process for the value portfolio was fairly quantitative. I had several metrics for selecting value stocks: a P/E ratio less than the sector average, a PEG ratio under one, a price to book ratio less than or equal to one, a high dividend yield, and an increasing cash flow (comparison of the two most recent fiscal years). These parameters were then entered into a stock screener (from Morningstar.com). The stocks that made it past the filter were more or less value stocks: companies in weak positions that seem to possess strong fundamentals. I chose several stocks from this listing, and filled the rest of the portfolio with blue chip stocks.

The selection of stocks for the technical portfolio was more qualitative. I looked at groups of stocks at a time, broken by sector. I tried to spot bullish technical indicators, attempting to find stocks at the beginning of an uptrend. There were many candidates; many companies seemed to be slowly recovering from the recession, following (more or less) the slight market uptrend. The technical stocks are also major companies, including Verizon Communications, McDonalds Corporation, Travelers Cos. Inc, and Merck & Co. As a beginning investor, I decided to pick established, reliable companies, especially because I intended to only have around ten companies between both portfolios.

As I conducted research and observed the simulation, I developed my own opinions about investment strategies and market theories. While some investors opt to use only technical or only fundamental analysis, I found that using both would be advantageous depending on the situation. Technical indicators, while useful for establishing trends and timing investments, can be unreliable or contradictory. Fundamentals seem to project how well a company should do, but they are grounded in very complicated and often intangible factors (i.e. what is good management? How significant is one ratio compared to another?). I see no reason to not have both types of analysis at one's disposal, which ties into my stance on the efficient market hypothesis. Proponents of technical analysis feel that information is completely reflected in a stock's price, while fundamental analysts think they can determine the true value and potential of a company. I feel that the market has become more efficient with the advent of the internet, but with enough effort, fundamentals can be used to discover subtleties about a company that people tend to overlook. Technical indicators probably become more reliable due to the fact that humans act predictably. With these items in mind, I am a fan of both schools of thought, and that inevitably affected my investment decisions.

Finally, I feel I was successful with the predictions I made throughout the simulation. I was confident that my value portfolio picks were sound, and only experienced a loss with the Johnson & Johnson stock. I attribute the loss to the patent expirations and massive product recalls, recalls that were more detrimental than anyone seemed to expect. Furthermore, I invested in Activision Blizzard in anticipation of a high amount of video game sales, but was cautious in case the sales did not meet expectations. I profited off of the hype, and sold before the company reported diminished sales. I was also pleased with my technical portfolio predictions. I was the weariest about Merck, as it had the most bearish technical indicators and the least promising media highlights. I should have sold, but I fell into the common technician trap: I hesitated. While "staying the course" is not a bad idea, I should have kept the short project timeframe in mind; ten weeks is not enough time to reap the full benefits of an uptrend, and is insufficient for a proper value portfolio.

In the future, I would make several changes to my investment approach. I only had four stocks in my technical portfolio, reducing its diversification; as a result, the loss caused by the Merck stock became more significant. Also, four of the eleven stocks were from the health sector. I would have suffered a much greater loss if the sector did poorly, and it would have been wise to diversify further. Finally, I feel like my technical analysis was limited because I used one chart per stock. A full analysis would consider industry and sector charts, and perhaps the use of multiple chart styles (i.e. bar charts, weekly charts, different moving averages, Bollinger bands, etc). As my first investment experience, I am not too disappointed; the mastery of fundamentals and technical indicators requires years of experience, not to mention an innate skill that seems to be associated with investment success. Overall, I feel like I emerged from the project a more competent investor, aware of the major investment pitfalls.

7 Company Profiles

Value Portfolio

Axis Capital Holdings (AXS)

Sector: Financial Services

Industry: Reinsurance

Size: Mid Cap

Business Description: Axis Capital Holdings provides specialty insurance and reinsurance around the world. The company uses subsidiaries in Bermuda, Ireland, Canada, Switzerland, Australia, Singapore, the U.K., and the U.S. to provide coverage for specialized classes of risk. These classes include terrorism, aviation and marine, war, political risk, commercial property, and onshore/offshore energy. Business comes from large insurance and reinsurance brokerages (Morningstar.com)

Abbott Laboratories (ABT)

Sector: Health Care

Industry: Drug Manufacturers – Major

Size: Large Cap

Business Description: Abbott Laboratories manufactures and markets pharmaceuticals, medical devices, blood glucose monitoring kits, and nutrition products. Products include prescription drugs, coronary stents, and nutritional liquids. After acquiring Advanced

Medical Optics, they also make eye-care products. Slightly less than 60% of the company’s revenue comes from pharmaceuticals (Morningstar.com).

Becton, Dickinson and Company (BDX)

Sector: Health Care

Industry: Medical Instruments & Supplies

Size: Large Cap

Business Description: Becton, Dickinson and Company is the world's largest manufacturer and distributor of medical surgical products, such as needles, syringes, and sharps-disposal units. The company also manufactures diagnostic instruments and reagents, as well as flow cytometry and cell imaging systems. International revenue accounts for approximately 55% of the company's business (Morningstar.com).

Exxon Mobil Corporation (XOM)

Sector: Energy

Industry: Major Integrated Oil and Gas

Size: Large Cap

Business Description: “The Exxon Mobil Corporation is an integrated oil and gas company that searches for, produces, and refines oil around the world. In 2009, it produced 2.4 million barrels of oil and 9.3 billion cubic feet of natural gas a day. At year-end 2009, reserves stood at 14.95 billion boe (plus 8.03 billion for equity companies), 62% of which are oil. The company is the world's largest refiner with 37 refineries, and it is one of the world's largest manufacturers of commodity and specialty chemicals" (Morningstar.com).

Johnson & Johnson (JNJ)

Sector: Health Care

Industry: Drug Manufacturers – Major

Size: Large Cap

Business Description: "Johnson & Johnson ranks as the world's largest and most diverse health-care company. The company comprises three divisions: pharmaceutical, medical devices and diagnostics, and consumer. While the pharmaceutical division currently represents 40% of total sales, we expect patent losses to reduce this proportion to 30% over the next 10 years, with the remaining divisions picking up equal share" (Morningstar.com).

Seaspan Corporation (SSW)

Sector: Business Services

Industry: Shipping

Size: Small Cap

Business Description: "Based in the Marshall Islands, Seaspan owns and operates a fleet of containerships that are employed under long-term fixed-rate contracts. Since going public in 2005, the company has expanded its fleet to approximately 45 vessels, with more than 20 additional vessels scheduled for delivery through 2012. Seaspan charters its fleet to some of the largest container-shipping companies in the world” (Morningstar.com)

Technical Portfolio

Verizon Communications Inc. (VZ)

Sector: Telecommunications

Industry: Telecom Services

Size: Large Cap

Business Description: “Verizon is the incumbent local phone company serving about 25% of the U.S. population. The firm owns a long-haul network that reaches cities around the globe. Verizon Wireless, the firm's 55%-owned partnership with Vodafone, serves about 90 million customers across the U.S. Verizon spun off its directories unit in 2006 and its local phone operations in Maine, Vermont, and New Hampshire in 2008. Additional lines were spun off to Frontier Communications in 2010” (Morningstar.com).

McDonald’s Corporation (MCD)

Sector: Consumer Services

Industry: Restaurants

Size: Large Cap

Business Description: “McDonald's generates revenue through company-owned restaurants, franchise royalties, and licensing arrangements. Restaurants offer a uniform value-priced menu, with some geographic variations. At the end of 2009, there were almost 32,500 McDonald's locations in 117 countries, including 26,200 operated by franchisees and affiliates and 6,300 company-owned units. McDonald's produced $72.4 billion in system wide sales during 2009, or about $2.2 million per restaurant” (Morningstar.com)

The Travelers Companies Inc. (TRV)

Sector: Financial Services

Industry: Insurance – Property and Casualty

Size: Large Cap

Business Description: “Leading commercial and personal insurer Travelers offers a broad product range, including auto, homeowners, and small commercial coverage. More-specialized products insure oil and gas firms, construction firms, banks, and identity theft. Policies are distributed via a network of more than 10,000 brokers and independent agents” (Morningstar.com).

Merck & Co Inc

Sector: Health Care

Industry: Drug Manufacturer

Size: Large Cap

Business Description: “Merck makes pharmaceutical products to treat conditions in a number of therapeutic areas, including cardiovascular disease, asthma, infections, and osteoporosis. The company also has a substantial vaccine business, with treatments to prevent hepatitis B and pediatric diseases as well as HPV and shingles. Following the Schering acquisition, about 45% of the company's sales are generated in the United States” (Morningstar.com)

References

1. Anderson, Chip. *Simply the Web's Best Financial Charts.* (2010). Thomson Financial. Retrieved July 7, 2010, from http://www.stockcharts.com

2. Cheng, Roger. (2010, July 24). Verizon Wireless Gains Outpace AT&T. *The Wall Street Journal*. Retrieved August 2, 2010, from http://www.wsj.com

3. Hamacher, T. (2006). *The pocket idiot's guide to: Investing in stocks*. New York: Alpha.

4. Langlois, Shawn. (2010, July 22). Travelers Cuts Outlook As Profit Comes Up Short. *Market Watch*. Retrieved August 2, 2010, from http://www.marketwatch.com/

5. Pring, M. J. (2002). *Technical analysis explained*. USA: McGraw-Hill.

6. Singer, Natasha. (2010, July 8). Merck Plans Layoff of 15% of Workforce. *The New York Times*. Retrieved from August 2, 2010, from http://www.nytimes.com

7. Tyson, E. (1999). *Investing for Dummies, Fifth Edition*. Hoboken, NJ: Wiley Publishing, Inc.

8. Venkataraman, Shanthi. (2010, July 6). Verizon Deal Drags Down Frontier Stock. *TheStreet*. Retrieved August 2, 2010, from http://www.thestreet.com

9. *Dow theory.* Retrieved June 25, 2010, from http://stockcharts.com/school/doku.php?id=chart_school:market_analysis:dow_theory

10. *Elliot wave theory.* Retrieved June 25, 2010, from http://stockcharts.com/school/doku.php?id=chart_school:market_analysis:elliott_wave_theory

11. *Hedging Your Bets: A Heads Up on Hedge Funds and Funds of Hedge Funds.* Retrieved June 25, 2010, from http://www.sec.gov/answers/hedge.htm

12. Premium Stock Screener. (n.d.). Retrieved July 1, 2010, from http://screen.morningstar.com/AdvStocks/Selector.html

13. *New York Stock Exchange*. (2000). Retrieved 15 July 2010, from http://www.NYSE.com

14. Special: Companies. (n.d.). Retrieved from wikinvest: http://www.wikinvest.com/special/Companies

15. (2010, July 9). Alert: The Travelers Companies (TRV) Showing Bearish Price Movement. *Market Intelligence Center*. Retrieved August 2, 2010, from http://www.marketintelligencecenter.com

Appendix

A1: Value Portfolio Finalized Records

Price Movements (in order shown): ABT, AXS, SSW, JNJ, XOM, BDX, ATVI

Table A1: Value Portfolio Price Movements

Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	49.71	50	49.62	49.83	7,508,000	49.83
30-Jul-10	48.72	49.36	48.3	49.08	7,819,800	49.08
29-Jul-10	49.44	49.77	48.93	48.98	8,846,400	48.98
28-Jul-10	49.31	49.48	48.85	49.22	6,856,700	49.22
27-Jul-10	49.5	49.5	48.96	49.27	4,636,600	49.27
26-Jul-10	48.82	49.37	48.82	49.24	5,918,100	49.24
23-Jul-10	48.98	49.16	48.58	48.93	8,723,300	48.93
22-Jul-10	49.02	49.54	48.36	49.01	10,753,800	49.01
21-Jul-10	47.73	49.38	44.59	48.68	14,195,400	48.68
20-Jul-10	47.13	47.55	46.86	47.47	7,907,100	47.47
19-Jul-10	47.41	47.58	47.25	47.41	4,200,100	47.41
16-Jul-10	47.91	48.14	47.02	47.07	9,138,400	47.07
15-Jul-10	47.86	48.11	47.68	48.02	5,796,500	48.02
14-Jul-10	47.53	47.86	47.17	47.85	5,552,100	47.85
13-Jul-10	47.78	47.89	47.62	47.67	6,920,400	47.67
13-Jul-10	$ 0.44 Dividend					
12-Jul-10	48.1	48.1	47.6	47.82	5,746,700	47.38
9-Jul-10	48.16	48.16	47.52	48.03	5,200,000	47.59
8-Jul-10	47.9	48.15	47.68	48.1	7,337,100	47.66
7-Jul-10	46.74	47.77	46.59	47.71	9,121,600	47.27
6-Jul-10	46.78	46.97	46.31	46.69	9,611,500	46.26
2-Jul-10	46.48	46.76	46.22	46.46	5,677,600	46.03
1-Jul-10	46.55	46.66	45.71	46.46	8,619,800	46.03
Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	31.57	31.79	31.39	31.77	836,200	31.77
30-Jul-10	30.95	31.45	30.86	31.17	788,600	31.17
29-Jul-10	31.02	31.35	30.71	31.16	1,079,800	31.16
28-Jul-10	31.1	31.2	30.67	30.69	1,257,000	30.69

27-Jul-10	31.73	31.88	31.19	31.19	1,652,300	31.19
26-Jul-10	31.65	31.76	31.46	31.52	1,629,400	31.52
23-Jul-10	31.21	31.63	31.17	31.58	1,087,900	31.58
22-Jul-10	31.54	31.58	31.11	31.3	1,000,100	31.3
21-Jul-10	31.92	31.94	31.07	31.15	964,100	31.15
20-Jul-10	31.02	31.78	30.93	31.78	862,000	31.78
19-Jul-10	31.35	31.58	31.03	31.49	556,800	31.49
16-Jul-10	31.79	31.92	31.18	31.2	800,600	31.2
15-Jul-10	32.06	32.08	31.57	31.98	808,100	31.98
14-Jul-10	31.9	32.23	31.83	32.03	712,400	32.03
13-Jul-10	31.93	32.11	31.81	32.02	622,000	32.02
12-Jul-10	31.64	31.81	31.52	31.69	542,500	31.69
9-Jul-10	31.15	31.7	31.02	31.68	659,200	31.68
8-Jul-10	31.16	31.2	30.78	31.04	638,900	31.04
7-Jul-10	29.62	30.76	29.59	30.75	911,900	30.75
6-Jul-10	30.11	30.11	29.32	29.54	726,600	29.54
2-Jul-10	29.89	29.97	29.45	29.57	471,000	29.57
1-Jul-10	29.73	29.81	29.2	29.64	1,158,900	29.64
Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	11.54	11.64	11.4	11.62	243,100	11.49
30-Jul-10	11.09	11.35	11.04	11.28	223,200	11.16
29-Jul-10	10.97	11.29	10.93	11.19	272,500	11.07
28-Jul-10	11.15	11.15	10.57	10.79	209,200	10.67
27-Jul-10	10.63	11.07	10.63	11	364,300	10.88
26-Jul-10	10.58	10.72	10.45	10.56	139,500	10.45
23-Jul-10	10.3	10.6	10.3	10.51	160,000	10.4
22-Jul-10	10.26	10.46	10.26	10.34	203,900	10.23
21-Jul-10	10.01	10.32	9.88	10.2	291,800	10.09
20-Jul-10	9.52	10.02	9.45	10.01	262,800	9.9
19-Jul-10	9.81	9.91	9.47	9.56	352,800	9.46
16-Jul-10	10.09	10.17	9.79	9.82	316,100	9.71
15-Jul-10	10.16	10.19	10	10.15	251,500	10.04
14-Jul-10	10.1	10.35	10	10.14	354,800	10.03
13-Jul-10	10.22	10.22	10.01	10.05	275,300	9.94
12-Jul-10	10.17	10.22	9.97	10.05	204,900	9.94
9-Jul-10	9.95	10.13	9.95	10.13	114,400	10.02
8-Jul-10	10	10.31	9.81	10.01	329,400	9.9
7-Jul-10	9.65	9.94	9.57	9.94	189,700	9.83
6-Jul-10	9.75	10	9.5	9.6	357,700	9.5
2-Jul-10	9.95	10.1	9.67	9.73	193,300	9.62
1-Jul-10	10.01	10.11	9.67	9.78	332,900	9.67

Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	58.5	58.88	58.41	58.72	11,455,600	58.72
30-Jul-10	57.63	58.36	57.27	58.09	12,978,000	58.09
29-Jul-10	58.1	58.27	57.71	57.83	13,031,000	57.83
28-Jul-10	58.14	58.25	57.65	57.83	13,502,100	57.83
27-Jul-10	57.95	58.44	57.62	58.1	16,964,000	58.1
26-Jul-10	57.65	58.01	57.48	57.74	11,775,200	57.74
23-Jul-10	57.28	57.64	57	57.63	15,076,600	57.63
22-Jul-10	57.43	57.62	56.86	57.02	17,972,900	57.02
21-Jul-10	58.8	58.8	56.87	57.12	25,707,600	57.12
20-Jul-10	58.45	58.77	58	58.58	22,304,800	58.58
19-Jul-10	59.72	59.79	59.37	59.57	10,277,500	59.57
16-Jul-10	60	60.19	59.25	59.44	17,569,900	59.44
15-Jul-10	60.62	60.75	59.9	60.26	12,839,300	60.26
14-Jul-10	60.16	60.68	60.05	60.62	9,668,500	60.62
13-Jul-10	60.59	60.96	60.44	60.5	10,924,500	60.5
12-Jul-10	60.48	60.54	60.06	60.21	10,797,200	60.21
9-Jul-10	60.97	61.07	60.38	60.54	12,174,000	60.54
8-Jul-10	60.93	61.73	60.64	61.38	15,895,900	61.38
7-Jul-10	59.33	60.7	59.04	60.61	17,280,000	60.61
6-Jul-10	59.5	59.6	58.67	59.08	15,461,100	59.08
2-Jul-10	59.42	59.59	58.85	59.08	10,534,400	59.08
1-Jul-10	59.07	59.25	58.65	59.07	17,973,500	59.07
Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	60.64	62.04	60.61	61.94	28,144,000	61.5
30-Jul-10	60.15	60.51	59.6	59.68	29,354,600	59.26
29-Jul-10	61.42	61.88	60.29	60.34	33,763,000	59.91
28-Jul-10	60.73	61.27	60.73	60.91	23,511,100	60.48
27-Jul-10	60.62	60.9	60.39	60.81	22,400,800	60.38
26-Jul-10	59.7	60.44	59.63	60.39	20,236,500	59.96
23-Jul-10	59.26	59.81	58.8	59.72	19,281,400	59.3
22-Jul-10	58.71	59.79	58.66	59.38	27,051,400	58.96
21-Jul-10	59.13	59.13	57.6	58.17	26,859,700	57.76
20-Jul-10	57.68	58.99	57.67	58.95	23,807,300	58.53
19-Jul-10	58.33	58.74	58.1	58.43	20,960,000	58.01
16-Jul-10	58.84	59.11	57.81	57.96	35,805,700	57.55
15-Jul-10	59.36	59.49	58.59	59.27	24,737,300	58.85
14-Jul-10	59.22	59.34	58.62	59.26	26,061,100	58.84
13-Jul-10	59.6	59.72	59.04	59.42	30,514,200	59
12-Jul-10	58.29	58.94	58.2	58.94	23,515,000	58.52
9-Jul-10	58.76	59.01	58.3	58.78	25,976,500	58.36

8-Jul-10	59.13	59.2	58.13	58.81	40,430,300	58.39
7-Jul-10	57.37	58.45	57.26	58.43	41,797,200	58.01
6-Jul-10	57.17	57.59	56.77	57.46	36,912,100	57.05
2-Jul-10	56.85	56.99	55.94	56.57	32,767,900	56.17
1-Jul-10	56.98	57.27	56.17	56.61	47,746,400	56.21
Date	Open	High	Low	Close	Volume	Adj Close*
6-Aug-10	71.19	71.8	70.49	71.68	1,214,700	71.68
5-Aug-10	71	71.78	70.74	71.61	1,370,600	71.61
4-Aug-10	70.63	71.27	70.25	71.19	1,226,200	71.19
3-Aug-10	70.36	70.89	70.11	70.46	1,311,000	70.46
2-Aug-10	69.55	70.5	69.2	70.4	2,255,700	70.4
30-Jul-10	67.15	69.15	66.87	68.8	2,110,800	68.8
29-Jul-10	69.32	69.93	67.13	67.54	2,089,100	67.54
28-Jul-10	68.09	68.8	67.39	68.33	2,236,100	68.33
27-Jul-10	69.22	69.26	68.09	68.27	1,736,700	68.27
26-Jul-10	67.06	68.64	66.72	68.55	1,917,000	68.55
23-Jul-10	67.07	67.07	66.47	66.89	2,774,400	66.89
22-Jul-10	67.26	68.24	67.1	67.4	2,360,500	67.4
21-Jul-10	68.26	68.26	66.64	66.92	1,876,700	66.92
20-Jul-10	67.53	68.17	67.14	68.13	1,734,600	68.13
19-Jul-10	67.98	68.38	67.81	68.06	765,700	68.06
16-Jul-10	69.16	69.33	67.62	67.75	1,221,100	67.75
15-Jul-10	69.3	69.69	68.87	69.36	955,100	69.36
14-Jul-10	69.28	69.59	68.52	69.59	1,375,200	69.59
13-Jul-10	69.55	70.08	69.4	69.52	1,252,800	69.52
12-Jul-10	69.41	69.46	68.83	69.08	1,245,200	69.08
9-Jul-10	69.91	70.09	69.05	69.46	1,012,400	69.46
8-Jul-10	70.52	71.02	69.44	69.96	1,791,200	69.96
7-Jul-10	68.14	70.3	67.9	70.28	2,112,500	70.28
6-Jul-10	68.63	68.83	67.59	68.18	1,490,100	68.18
2-Jul-10	67.34	68.36	67.29	67.97	1,487,300	67.97
1-Jul-10	67.73	67.73	66.63	67.29	2,283,300	67.29
Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	11.92	12.09	11.85	11.95	13,797,200	11.95
30-Jul-10	11.65	11.95	11.6	11.88	5,960,800	11.88
29-Jul-10	11.92	11.94	11.57	11.78	8,134,800	11.78
28-Jul-10	11.97	11.99	11.73	11.86	9,976,900	11.86
27-Jul-10	12.02	12.04	11.77	11.94	17,841,500	11.94
26-Jul-10	11.77	12.04	11.7	11.91	11,466,200	11.91
23-Jul-10	11.63	11.85	11.57	11.73	10,134,000	11.73

22-Jul-10	11.34	11.78	11.34	11.62	21,110,100	11.62
21-Jul-10	11.48	11.5	11.21	11.24	8,037,900	11.24
20-Jul-10	11.2	11.47	11.16	11.46	5,556,600	11.46
19-Jul-10	11.18	11.48	11.12	11.38	11,866,500	11.38
16-Jul-10	11.36	11.39	11.08	11.12	9,854,100	11.12
15-Jul-10	11.32	11.42	11.19	11.33	7,269,300	11.33
14-Jul-10	11.43	11.54	11.2	11.3	8,141,900	11.3
13-Jul-10	11.22	11.44	11.11	11.41	12,004,900	11.41
12-Jul-10	11.05	11.13	10.93	11.12	9,768,200	11.12
9-Jul-10	11.08	11.13	10.99	11.09	4,053,700	11.09
8-Jul-10	11	11.1	10.87	11.07	10,224,100	11.07
7-Jul-10	10.54	10.99	10.53	10.98	12,254,700	10.98
6-Jul-10	10.78	10.82	10.41	10.54	9,297,800	10.54
2-Jul-10	10.5	10.69	10.35	10.64	8,597,500	10.64
1-Jul-10	10.48	10.66	10.32	10.5	9,840,700	10.5

A2: Technical Portfolio Finalized Records

Price Movements (in order shown): VZ, MCD, MRK, TRV

Table A2: Technical Portfolio Price Movements

Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	29.54	29.66	29.31	29.56	25,041,100	29.56
30-Jul-10	28.61	29.24	28.61	29.06	19,103,200	29.06
29-Jul-10	29.04	29.19	28.78	28.88	24,238,300	28.88
28-Jul-10	28.57	29.16	28.55	28.91	31,990,300	28.91
27-Jul-10	28.32	28.75	28.3	28.59	22,731,100	28.59
26-Jul-10	28.03	28.35	28.03	28.28	15,439,700	28.28
23-Jul-10	27.82	28.18	27.49	28.02	47,092,800	28.02
22-Jul-10	26.72	27.16	26.69	27	22,514,500	27
21-Jul-10	26.8	26.81	26.41	26.52	20,639,200	26.52
20-Jul-10	26.63	26.77	26.56	26.67	21,387,100	26.67
19-Jul-10	26.78	26.92	26.7	26.72	14,947,000	26.72
16-Jul-10	26.78	27	26.6	26.69	21,672,900	26.69
15-Jul-10	26.87	26.87	26.67	26.8	18,416,100	26.8
14-Jul-10	26.93	27.05	26.63	26.84	18,155,100	26.84
13-Jul-10	26.85	27.07	26.71	26.89	22,709,200	26.89
12-Jul-10	26.65	26.7	26.42	26.49	20,748,500	26.49
9-Jul-10	26.81	26.82	26.47	26.65	18,324,600	26.65
8-Jul-10	26.72	26.78	26.32	26.78	19,227,900	26.78

Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	70.5	70.5	69.93	70.25	5,873,100	70.25
30-Jul-10	68.92	69.98	68.59	69.73	5,990,300	69.73
29-Jul-10	70.2	70.25	68.9	69.38	5,131,700	69.38
28-Jul-10	70.21	70.38	69.37	69.77	6,708,400	69.77
27-Jul-10	71.03	71.03	69.99	70.4	6,214,900	70.4
26-Jul-10	70.04	70.87	69.9	70.87	5,525,400	70.87
23-Jul-10	70.76	71.17	68.94	69.9	12,238,900	69.9
22-Jul-10	70.51	71.54	70.51	71.4	6,717,900	71.4
21-Jul-10	70.93	71	69.65	70.11	5,734,400	70.11
20-Jul-10	69.47	70.96	69.44	70.87	5,474,300	70.87
19-Jul-10	69.97	70.38	69.45	69.91	5,072,700	69.91
16-Jul-10	71.16	71.28	69.86	69.94	5,981,000	69.94
15-Jul-10	70.9	71.46	70.43	71.33	5,470,100	71.33
14-Jul-10	70.5	70.98	70.16	70.9	4,476,100	70.9
13-Jul-10	70.44	71.07	70.12	70.84	6,072,100	70.84
12-Jul-10	68.96	70	68.96	69.94	5,420,800	69.94
9-Jul-10	69.08	69.33	68.75	69.22	4,513,000	69.22
8-Jul-10	67.8	69.15	67.55	69.02	7,871,200	69.02
Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	34.86	35.12	34.55	35.07	12,106,900	35.07
30-Jul-10	34.35	34.63	33.82	34.46	21,722,000	34.46
29-Jul-10	35	35.3	34.6	35.06	14,571,300	35.06
28-Jul-10	35.14	35.41	34.62	34.74	9,709,800	34.74
27-Jul-10	35.32	35.59	35	35.18	12,677,300	35.18
26-Jul-10	35	35.3	34.81	35.27	9,634,500	35.27
23-Jul-10	35.17	35.17	34.41	34.87	15,679,200	34.87
22-Jul-10	35.36	35.52	35	35.18	15,728,000	35.18
21-Jul-10	35.48	35.69	34.98	35.19	12,814,400	35.19
20-Jul-10	35.52	35.66	35.2	35.66	14,011,700	35.66
19-Jul-10	35.94	36.11	35.69	35.8	10,118,500	35.8
16-Jul-10	36.53	36.8	35.88	35.91	16,579,000	35.91
15-Jul-10	36.25	36.56	35.9	36.49	10,991,100	36.49
14-Jul-10	36.21	36.37	35.83	36.2	11,199,100	36.2
13-Jul-10	36.13	36.7	36.03	36.45	12,904,100	36.45
12-Jul-10	36.2	36.24	35.84	36.09	12,617,600	36.09
9-Jul-10	35.91	36.4	35.72	36.3	11,993,400	36.3
8-Jul-10	35.87	35.87	35.33	35.86	15,567,200	35.86
Date	Open	High	Low	Close	Volume	Adj Close*
2-Aug-10	51.04	51.22	50.51	50.85	4,957,900	50.85
30-Jul-10	50.03	50.61	50.02	50.45	5,752,000	50.45
29-Jul-10	50.61	50.95	50.1	50.52	6,845,100	50.52

28-Jul-10	50.56	50.81	50.15	50.29	4,455,100	50.29
27-Jul-10	50.75	50.75	50.14	50.58	6,312,000	50.58
26-Jul-10	50.28	50.47	49.96	50.45	4,814,400	50.45
23-Jul-10	48.88	50.14	48.6	50.14	7,008,600	50.14
22-Jul-10	48.77	50.19	48.77	49.29	6,956,500	49.29
21-Jul-10	50.31	50.72	49.8	49.87	3,961,700	49.87
20-Jul-10	49.2	50.39	49.2	50.35	3,801,300	50.35
19-Jul-10	49.79	50	49.27	49.71	2,667,200	49.71
16-Jul-10	50.11	50.5	49.51	49.62	5,952,700	49.62
15-Jul-10	51.35	51.35	49.99	50.3	7,023,600	50.3
14-Jul-10	51.13	51.48	50.83	51.39	3,866,000	51.39
13-Jul-10	51.48	51.64	51.14	51.2	5,224,200	51.2
12-Jul-10	50.92	51.43	50.79	51.12	3,025,800	51.12
9-Jul-10	50.15	51.16	50.11	51.15	3,095,900	51.15
8-Jul-10	50.04	50.15	49.51	50.09	3,231,500	50.09